

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, Applicants have amended each of claims 1 and 4 to recite that the welding fills the gap exceeding the first size, and to recite that the friction stir welding is performed after the welding. Claim 3 has been amended to be dependent on claim 1, rather than on claim 2.

In addition, Applicants are adding new claims 5-15 to the application. Claim 5 sets forth subject matter expressed in claim 3, but is dependent on claim 4. Claims 6, 7, 11 and 12, dependent respectively on claims 5, 4, 3 and 1, recite that the welding is arc-welding; and claims 8 and 13, dependent respectively on claims 4 and 1, recite that the welding is performed continuously along the joint line. Claims 9 and 14, dependent respectively on claims 4 and 1, recite that the welding is performed using a filling material, with the gap being filled with the filling material during the welding; and claims 10 and 15, dependent respectively on claims 4 and 1, recite that the welding provides a weld having sufficient strength such that during the friction stir welding the butted portion is not parted.

In connection with amendments to the previously considered claims, as well as in connection with the newly added claims, note, for example, Fig. 15 of Applicants' original disclosure, and the description in connection therewith on pages 23 and 24 of Applicants' specification.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the reference applied by

the Examiner in rejecting claims in the Office Action mailed May 29, 2003, that is, the teachings of European Patent Application No. EP 947 280 A1(Kawasaki), under the provisions of 35 USC §102 and 35 USC §103.

It is respectfully submitted that this reference as applied by the Examiner would have neither taught nor would have suggested such a friction stir welding method, or such a method for manufacturing a car body, as in the present claims, including welding areas of a gap exceeding a first size formed at butted portions between members abutting each other (or formed at a butted portion between an underframe and side structures or a butted portion between the side structures and a roof structure), the welding filling the gap; and, after the welding, performing friction stir welding along the joint line including the areas welded. See claim 1; note also claim 4.

In addition, it is respectfully submitted that the applied reference does not disclose, nor would have suggested, such a friction stir welding method or such method for manufacturing a car body, as in the present claims, including the welding, which fills the gap, and, after the welding, the friction stir welding; and wherein a rotary tool used for the friction stir welding includes a smaller diameter portion to be inserted to the welding area and a larger diameter portion positioned outside the welding area, and with the friction stir welding being performed with a boundary between the smaller and larger diameter portions being positioned within a nugget protruding from surfaces formed during the welding step. Note claims 3 and 5.

Furthermore, it is respectfully submitted that the disclosure of the applied reference would have neither taught nor would have suggested other aspects of the present invention as in the remaining, dependent claims, having aspects of the present

invention as discussed previously in connection with claims 1 and 4, and in addition wherein the welding is performed to all the joint lines to which the friction stir welding is to be performed (see claim 2); and/or wherein the welding is arc-welding (note claims 6, 7, 11 and 12); and/or wherein the welding is performed continuously along the joint line (see claims 8 and 13); and/or wherein the welding is performed using a filling material, with the gap being filled with the filling material during the welding (see claims 9 and 14); and/or wherein the welding provides a weld having sufficient strength such that during the friction stir welding the butted portion is not parted (see claims 10 and 15).

According to the present invention, by utilizing the welding to fill the gap, prior to the friction stir welding, a sufficiently strong friction stir welding weld can be achieved, even where the gap between the two members being welded is relatively large (for example, exceeding 1 mm), and even without use of projecting portions on the two members, although such projecting portions can be used.

In addition, the weld can be used both to provide a filling material to fill the gap, whereby the friction stir weld can be formed without disadvantageous voids or depressions, while also providing adjacent members forming the joint line that are not parted by the force of the friction stir welding.

Kawasaki discloses a friction stir welding method, which can carry out the friction stir welding even where a size of the gap between two members to be welded is large. Note paragraph [0014] on page 2 of this patent document. The disclosed method includes abutting two welding members to be subjected to welding with a gap; detecting a size of the gap between the two welding members to be subjected to

welding; rotating and moving a rotary body while reciprocating the rotary body to an orthogonal direction with a welding line of the two welding members to be subjected to welding along to the welding line; and when the gap is less than a predetermined value, stopping the reciprocating motion of the rotary body. See paragraph [0016] on page 3, together with [0017] and [0018] on page 3, of this patent document. Note also [0028] and [0031] on page 4, and [0035] - [0037] on page 5 of this patent document. See also paragraphs [0043] and [0044] on page 6 of this patent document.

As can be appreciated from the foregoing, as well as from a complete review of this patent document, Kawasaki discloses a friction stir welding method using solely friction stir welding, wherein the friction stir welding is performed using both a reciprocating movement orthogonal to the direction of the joint line together with movement along the joint line. It is respectfully submitted that the movements in Kawasaki take place during the friction stir welding. It is respectfully submitted that this method as disclosed in Kawasaki, using separate motions during the friction stir welding, require relatively complex movements and do not disclose, nor would have suggested, such a friction stir welding method or such method for manufacturing a car body as in the present claims, including, inter alia, the welding which fills the gap exceeding a first size; and after the welding, performing the friction stir welding.

Clearly, the method disclosed in Kawasaki, having the relatively complex movement of the friction stir welding, would have neither taught nor would have suggested the method according to the present invention wherein the gap is filled by the welding prior to friction stir welding, thereby avoiding the relatively complex motion of the rotary tool during the friction stir welding as in Kawasaki, particularly wherein the

welding prior to the friction stir welding is arc-welding as in various of the present claims, and also wherein the welding is performed using a filling material, with the gap being filled with the filling material during the welding, as in various of the present claims.

In addition, according to various of the present claims the friction stir welding is performed with the boundary between the smaller and larger diameter portions of the friction stir welding rotary tool being positioned within a nugget, protruding from surfaces of the members, formed during the welding. Such processing very much simplifies the friction stir welding processing, as compared with, for example, the complex motion along the joint line and orthogonal to the joint line as in Kawasaki. Clearly, Kawasaki would have neither taught nor would have suggested the presently claimed invention, including the various aspects thereof in the present claims, and advantages achieved thereby.

The contention by the Examiner on page 2 of the Office Action mailed May 29, 2003, with respect to claim 1, that Kawasaki teaches "welding areas of the gap formed at the butted portion where the gap exceeds a first size"; and the further contention by the Examiner with respect to claim 4, on page 3 of the Office Action mailed May 29, 2003, that Kawasaki teaches "welding the areas of a gap exceeding a first value formed at a butted portion between an underframe and side structures or the butted portion between the side structures and a roof structure", are noted. The Examiner has not pointed to a specific portion of Kawasaki which teaches such welding. It is respectfully submitted that, contrary to the contentions by the Examiner, Kawasaki would have neither taught nor would have suggested such welding as in the

present claims, particularly as presently amended, wherein such welding fills the gap; and, moreover, that Kawasaki would have neither taught nor would have suggested the friction stir welding as in the present claims, after the welding which fills the gap.

The contention by the Examiner bridging pages 2 and 3 of the Office Action mailed May 29, 2003, in connection with claim 3, that according to Kawasaki "said friction stir welding is performed with the boundary between said smaller diameter portion and said larger diameter portion being positioned within a nugget protruding from surfaces of said members formed during said welding step", is respectfully traversed. It is respectfully submitted that the thick thickness portions 56 and 66 in Figs. 1 and 2 of Kawasaki are portions of the extruded frame members existing prior to the welding step. It is respectfully submitted that Kawasaki would have neither taught nor would have suggested the presently claimed invention, including, inter alia, wherein the friction stir welding is performed with the boundary between the smaller diameter portion and the larger diameter portion being positioned within a nugget protruding from surfaces of the members formed during the welding step.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application are respectfully requested.

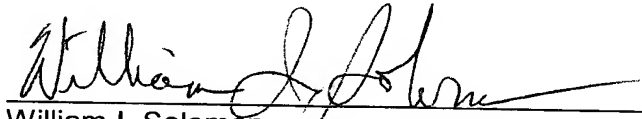
To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with the filing of

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this paper, including extension of time fees, to the Deposit Account No. 01-2135 (Case No. 648.40349VX1), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read "William I. Solomon", written over a horizontal line.

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